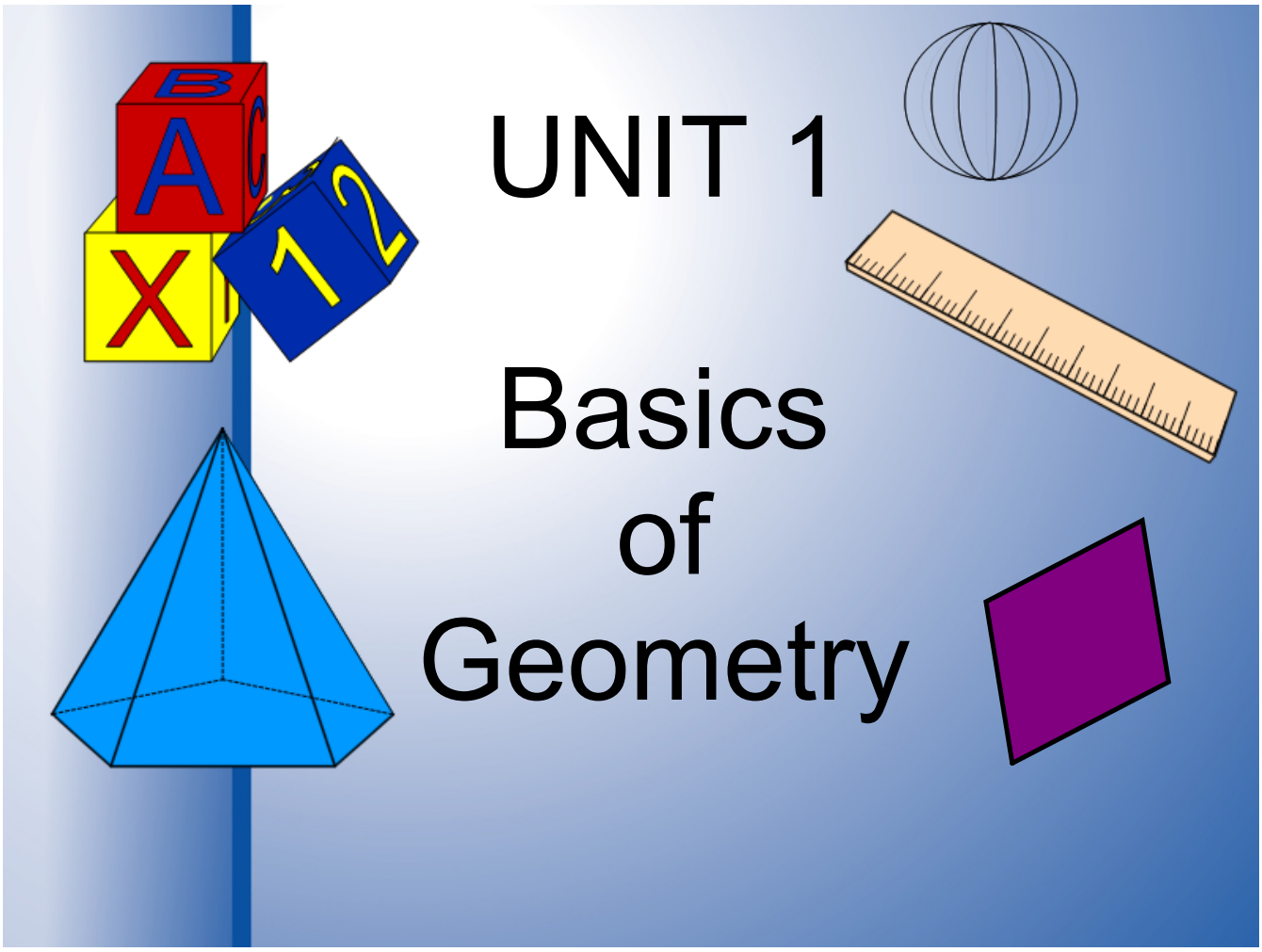
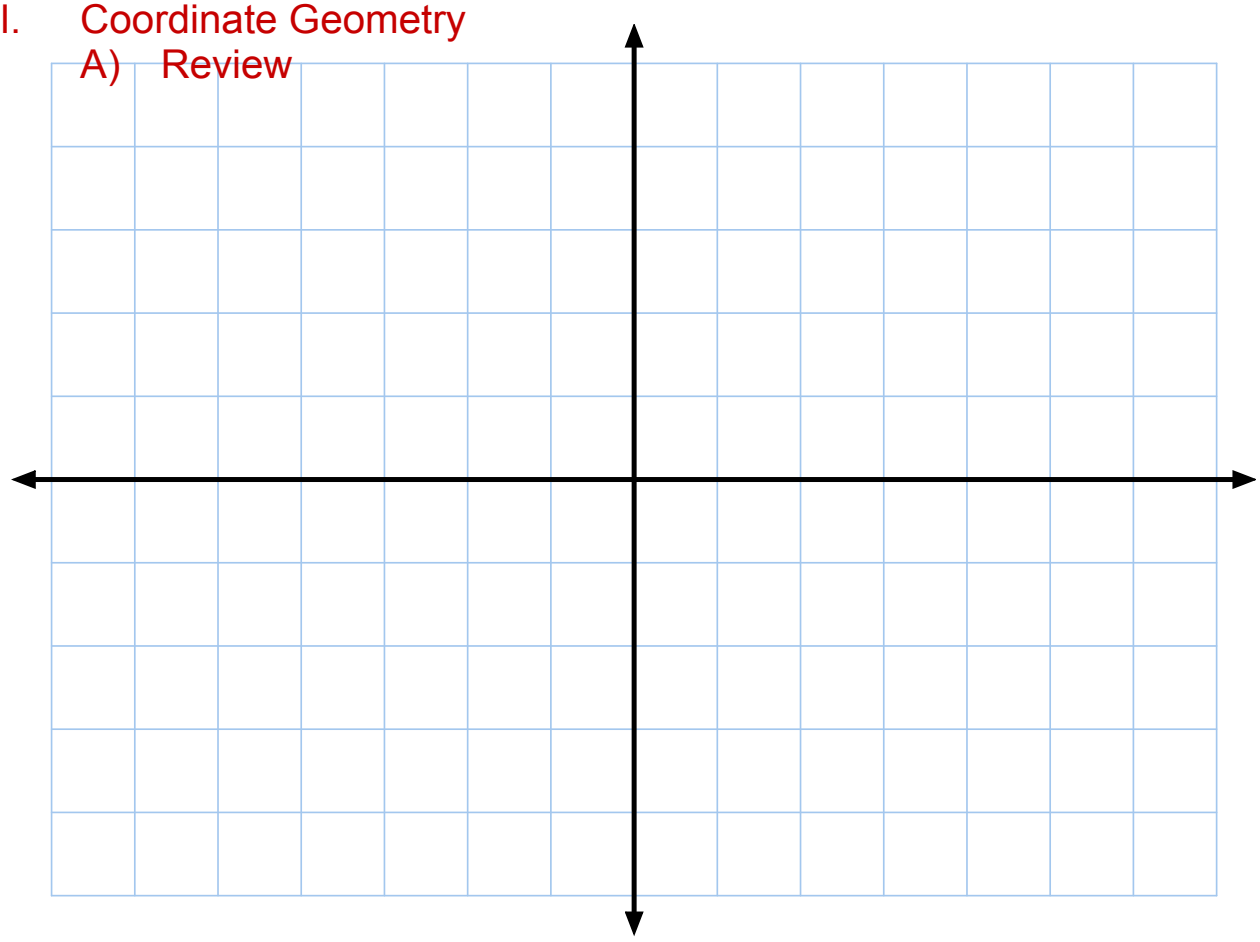

UNIT 1
Basics
of
Geometry

I. Coordinate Geometry

A) Review



1.2

Building Blocks of Geometry

A) Point

A •

a location in space

1) has no size
2) Named by ONE capital letter

B) Space

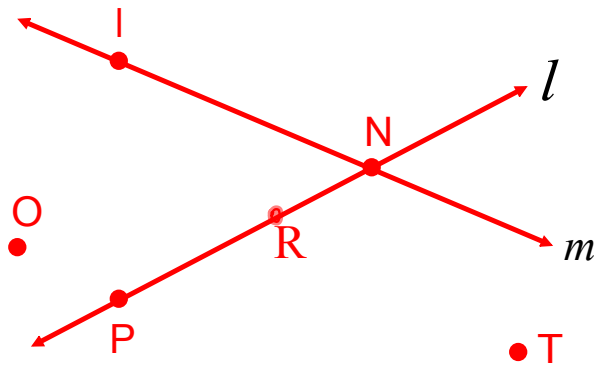
the set of all points

C) Line

extends in opposite directions without end

1) has no width
2) cannot be measured
3) named by TWO capital letters or ONE lower case cursive letter

3) Collinear Points are points that lie on the same line



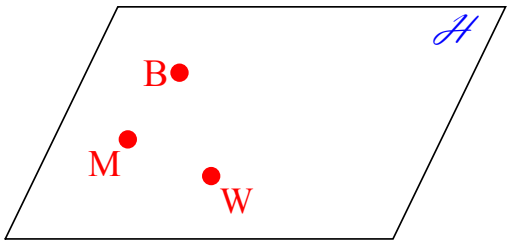
a) Any two points are collinear!!

b) Name each line two ways

D) Plane

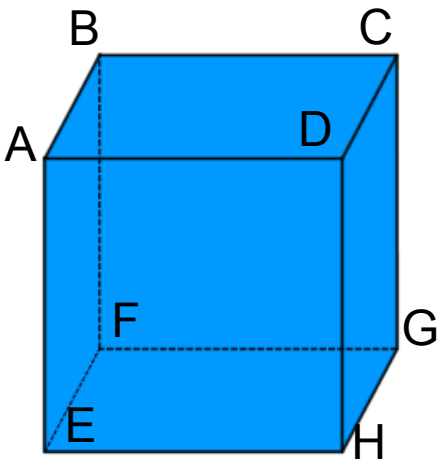
a flat surface with no thickness

1) extends in all directions without end
2) named by ONE cursive capital letter or 3 non-collinear points



3) Name the plane two ways

3) Points and lines in the same plane are coplanar.



a) Any three points are coplanar!!

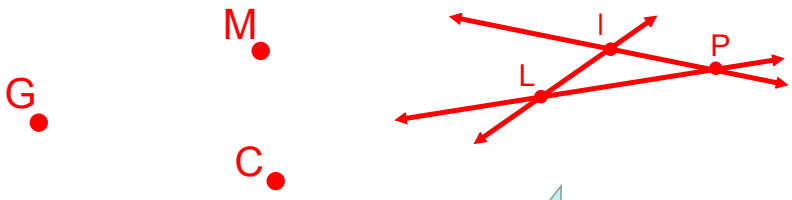
b) name a plane that contains segment FG?

c) Name the planes that contain D?

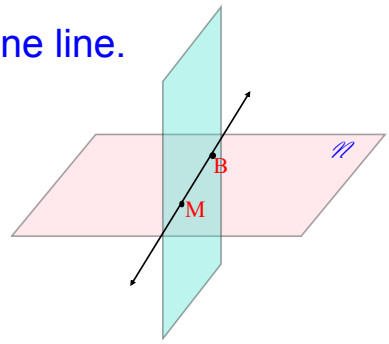
III. Plane Postulates

A) Postulate ~~(or axiom)~~ is an accepted statement of fact.

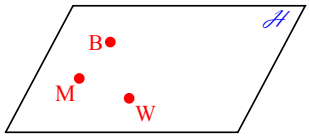
1) Two points determine a line.



2) Two planes intersect in exactly one line.



3) Three non- collinear points determine exactly one plane.



Bellwork

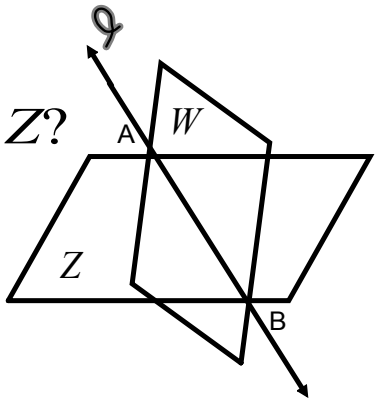
1. Complete: _____ points determine a line. _____ points determine a plane.

2. Give two names for a line that contains points A and B.

Refer to the figure for questions 3 and 4.

3. Name a line in plane Z.

4. How many lines are in the plane *Z*?



Notes: Section 1.3 - Using Formulas

I. Area: amount of space inside the figure (expressed in units squared)

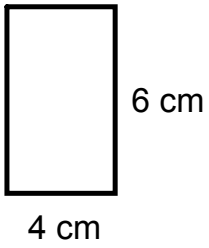
$$A = l * w$$

II. Perimeter: distance around a figure

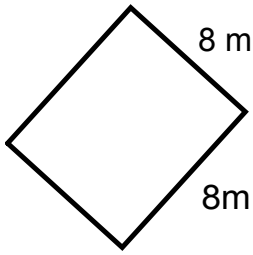
$$P = 2l + 2w$$

ex: Find the perimeter and area of each rectangle.

1)



2)



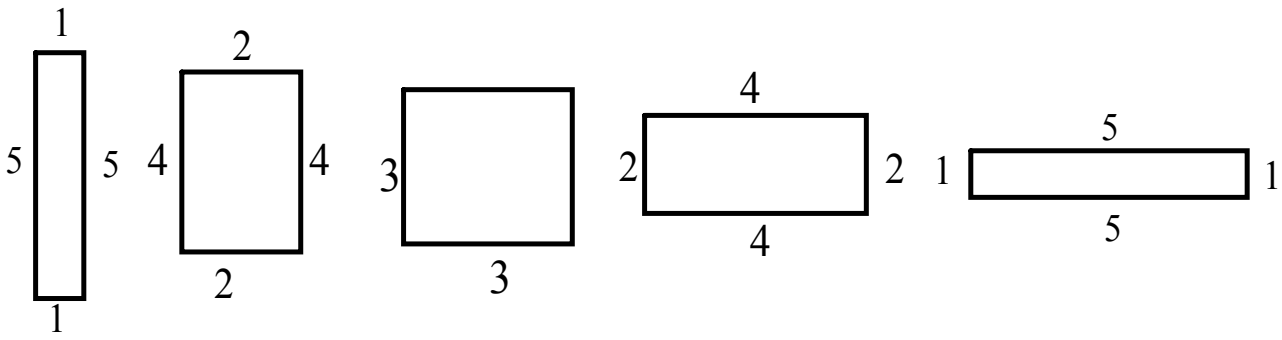
ex: Find the missing measure in each formula.

3) l = 3, w = ?, P = 20

4) l = ?, w = 4, A = 36

III. Max Area: when given a figures perimeter, you can find the most space that figure will contain.

ex: One type of pet enclosure is made up of 12 sections of fencing, connected by hinges. This enclosure folds for easy storage and is flexible for making different-sized areas in which your pet can play. Suppose the sections are positioned to make a rectangle. What are the dimensions of the rectangle that provided the maximum area for your pet?



w	l	Area = l * w
1	5	5
2	4	8
3	3	9
4	2	8
5	1	5

CP

1) $10 + x = -4$

2) $7 = 15 - x$

3) $12 = -3x$

4) $\frac{x}{10} = -3$

5) $20 = \frac{4}{3}x$

6) $17 = 15 - 2x$

7) $7x + 4 = 10x - 11$

8) $7x + 8 - 11x = 2 - x$

9) $3(x - 2) - x = 14$

10) $7(x + 4) + 3x - 12 = 2x$

Hon

1) $11 - y = 4$

2) $\frac{a}{5} = -3$

3) $6y = -14$

4) $7a - 10a = 3a + 6$

5) $7(4x + 3) = 10$

6) $-1 + 2(m + 1) = 5(2m - 3)$

7) $2a - (a + 4) = 10$

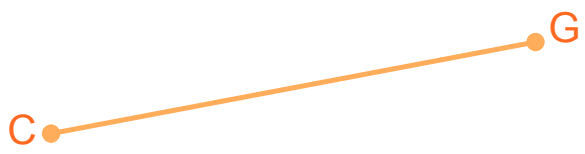
8) $\frac{2}{3}x - 11 = 2$

1.4

Geometric terms

A) Segment

part of a line with two endpoints.

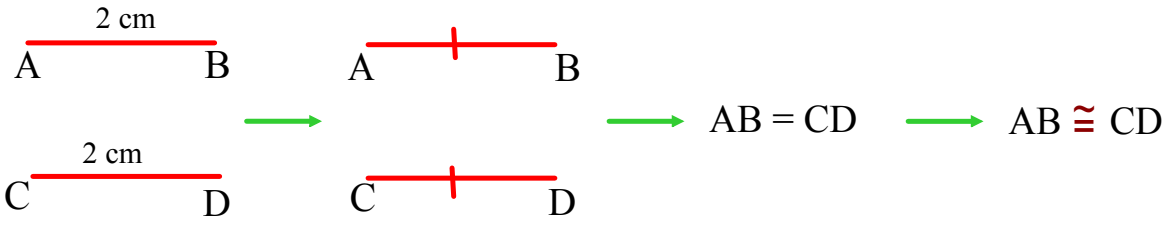


CG represents the measure of the segment

$\overline{CG}$ represents the picture of the segment

Measuring Segments and Angles

A) Congruent Segments have the same length
B) Congruent Angles have the same degree measure



measure of AB = _____

AB means

≅ means

Segment Addition Postulate (SAP)

If three points A, B, and C are collinear and B is between A and C, then

AB + BC = AC

Examples:

1. If B is between A and C
   AC = 23
   AB = 2x - 6
   BC = x - 7
   Find AB and BC

2. If N is between A and B
AN = 4x - 20
AB = x + 40
NB = 2x + 30
Find AB

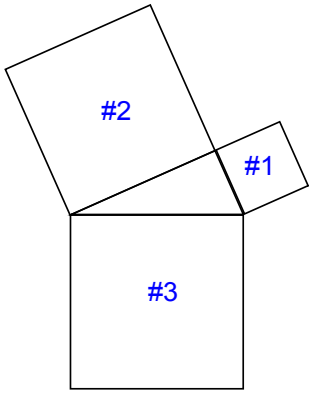
3. If N is between A and B

$AN = \frac{2}{3}(4x - 5)$

$BN = \frac{1}{3}$

$AB = \frac{3}{5}(2x + 1)$

Find AN, BN, AB



If each square was a piece of gold, which would you rather be given:

a) both piece #1 and #2 or

b) piece #3

A) Pythagorean Theorem

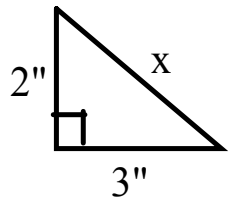
the sum of the squares of the legs (sum of the area of #1 and #2) are equal to the square of the hypotenuse (area of #3)

In the right triangle, *a* and *b* are the legs and *c* is the hypotenuse, then

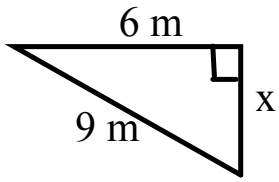
$$a^2 + b^2 = c^2$$

Ex:

1)



2)



3) leg = 9 cm
leg = _____
hypotenuse = 15 cm

Hint: Check your measures...the hypotenuse should be the longest.

B) Pythagorean Triples

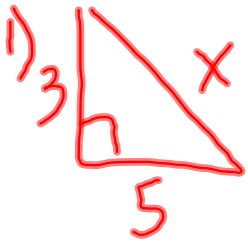
a set of three positive integers that makes the pythagorean theorem true.

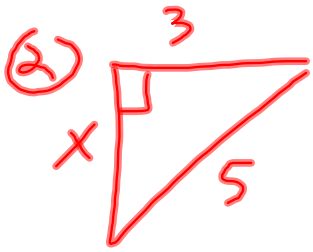
Ex:

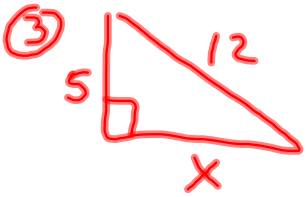
Are the sets of numbers pythagorean triples?

1) 12, 16, 20 2) 9, 40, 41 3) 18, 24, 32

One of the most common triples is 3 - 4 - 5.

1) 

2) 

3) 

B is between X & D

4) $XB = 3x$, $XD = 8$, $BD = 5x$ — $x = ?$, $BD = ?$

5) $XD = 50$, $XB = 3(x+7)$, $BD = 2(x-3)$ — $x = ?$, $XB = ?$

6) Find the distance between $(-3, 10)$ & $(4, -1)$

C) Distance between two points

1) on the number line D= l a-b l

2) on the coordinate plane

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

Ex: Find AB if you are given the following points:

1) A(4, 8) and B(2, -3)

2) A(-1, -2) and B(2, 4)

1.5
A)Midpoint on a number line (average the endpoints) (a+b)/2

X is the midpoint of R and S R=5, S=-9 X=____

R= 8, X= 3 S= ____

B). Midpoint of a segment (average of the endpoints)

$$M(x_m, y_m) = (\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2})$$

midpoint = _____

Ex: If M is the midpoint of the segment AB,

1) Find M if
A(8, 9)
B(-6, -3)

2) FInd M if
A(-3, -5)
B(2, 7)

3) FInd B if
A(1, 4)
M(-1, 5)

C) Midpoint is a point that divides a segment into two congruent segments

D) Segment Bisector- segment that intersects at the midpoint of a segment

E) Perpendicular Bisector is a line, segment or ray that forms a right angle at its midpoint.

Examples: If C is the midpoint of $\overline{AB}$:

4. AC = 5x + 9
   CB = 8x - 36
   Find AC

5. BC = 2x + 5
   AB = 3x + 18
   Find AB

1.6 Angles

A) Ray

part of a line with one endpoint

always list the endpoint first

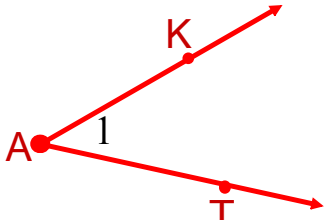
B) Opposite Rays

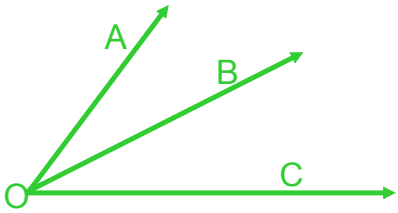
two collinear rays with a common endpoint

always forms a line

Angle Relationships

A) Angle
formed by two rays with
the same endpoint





B) Acute Angle measures > 0 and < 90

C) Right Angle measures = 90

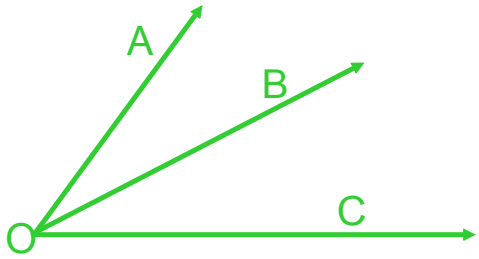
D) Obtuse Angle measures > 90 and < 180

E) Straight Angle measure = 180

F) Perpendicular Lines are lines that intersect
to form right angles

Angle Addition Postulate (AAP)

1) If pt B is in the interior of <AOC, then
$m\angle AOB + m\angle BOC = m\angle AOC$

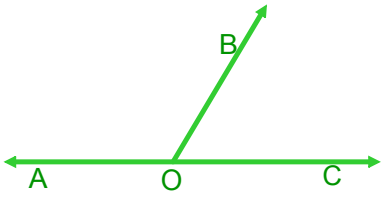


2) If <AOC is a straight angle, then
$m\angle AOB + m\angle BOC = 180$

Examples:

1. If pt B is in the interior of <AOC,
   $m\angle AOB = x + 3$
   $m\angle BOC = 2x + 4$
   $m\angle AOC = 25$
   Find $m\angle BOC$

2. $m\angle AOB = 4x + 15$
   $m\angle BOC = x + 25$
   Find x



D) Angle Bisector is a ray that divides an angle into two congruent angles

Examples:

3. Find $m\angle AWB$ if $\overrightarrow{WR}$ bisects $\angle AWB$ and
$m\angle AWR = x$
$m\angle BWR = 4x - 48$

1.7

Complementary Angles

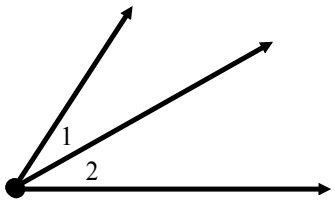
two angles whose measures have a sum of 90

Supplementary Angles

two angles whose measures have a sum of 180

Adjacent Angles

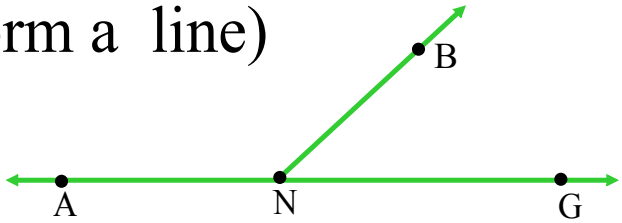
two coplanar angles with a common side, common vertex



Linear Pair

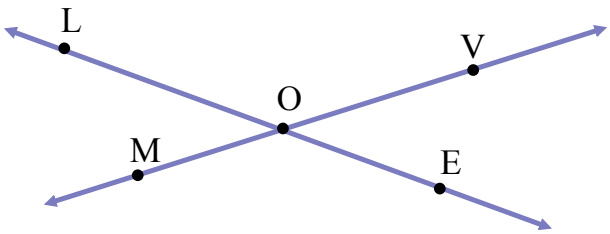
a pair of angles that are adjacent and supplementary

(they form a line)

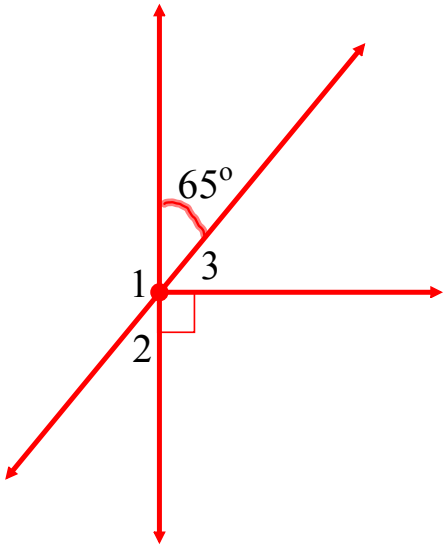


Vertical Angles

two non-adjacent angles formed by intersecting lines



All vertical angles are congruent

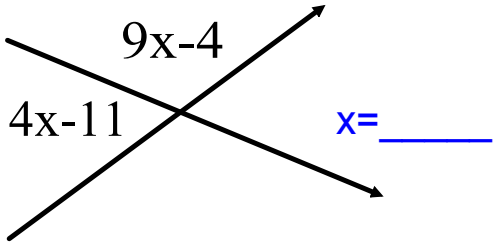


Find the measure of each:

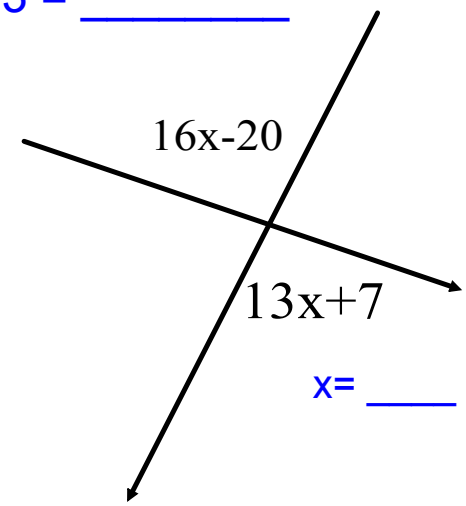
m<1 = _____

m<2 = _____

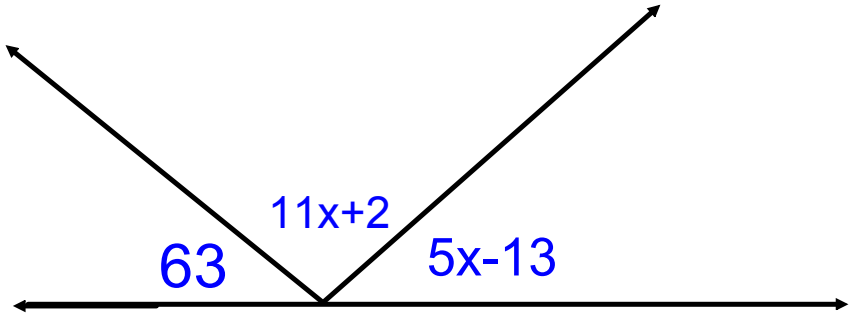
m<3 = _____



x=_____



x= ____

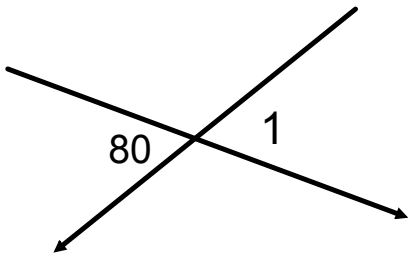


x=_____

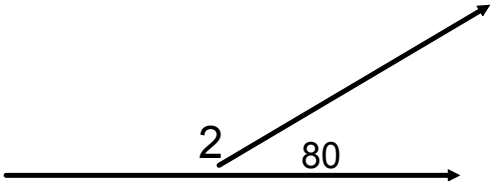
_____pts determine a line
_____pts determine a plane

R
≈
r
AR
$\overline{AR}$
$\overrightarrow{AR}$

postulate-
theorem-



m<1= Why?

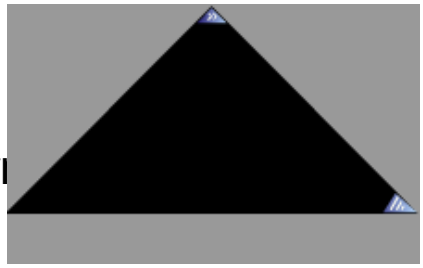


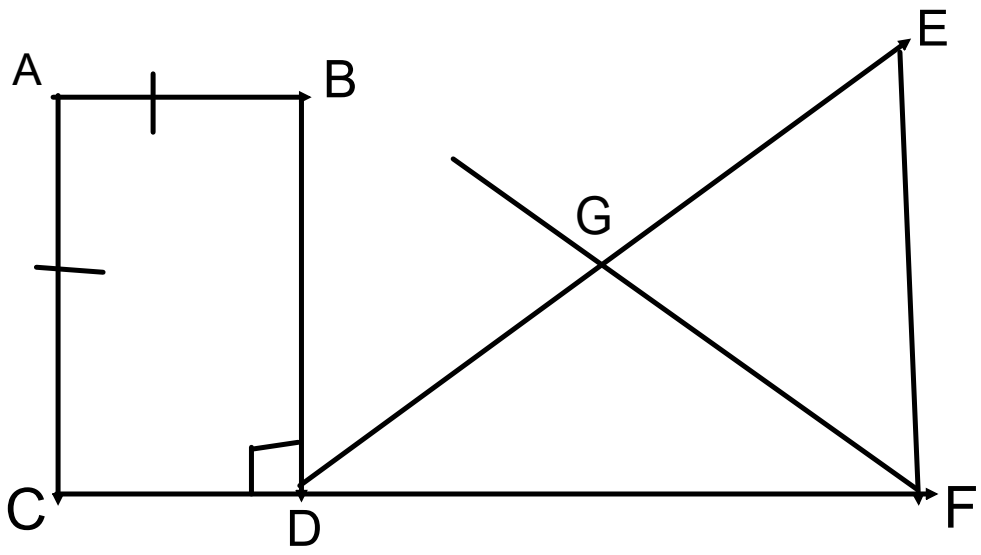
m<2= Why?

Theorems

1. vertical angles 

2. angles in a linear pair are 

3. Perpendicular lines for 



Can you assume the following things?

Attachments

UNIT 1 (PP).ppt